Exhibit 12

Exhibit 12
Claim 23 of U.S. Patent No. 10,771,302

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:"

23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:	Toyota's Accused Products include vehicles equipped with components and/or devices that enable connectivity to 4G/LTE networks and services, including services sold and provided by Toyota. To the extent the preamble is considered a limitation, Toyota's Accused Products meet the preamble of the '302 patent. *E.g.,* The LTE specification (Series 36, Release 8) supports user equipment (UE) to perform a sounding reference signal (SRS) procedure. For example, release 8 of the 36 series 3GPP specifications was frozen in December of 2008 and that release was used as the basis for the first wave of LTE equipment. The LTE marketplace currently supports a mix of releases from Release 8 through Release 15. For ease of review release 8 of the LTE specification is cited below, but similar cites are available for each corresponding release on the market. An LTE communication system has user equipments (UEs) transmit to and receive signals from eNodeBs.

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:"

4 Overall architecture

The E-UTRAN consists of eNBs, providing the E-UTRA user plane (PDCP/RLC/MAC/PHY) and control plane (RRC) protocol terminations towards the UE. The eNBs are interconnected with each other by means of the X2 interface. The eNBs are also connected by means of the S1 interface to the EPC (Evolved Packet Core), more specifically to the MME (Mobility Management Entity) by means of the S1-MME and to the Serving Gateway (S-GW) by means of the S1-U. The S1 interface supports a many-to-many relation between MMEs / Serving Gateways and eNBs.

The E-UTRAN architecture is illustrated in Figure 4 below.

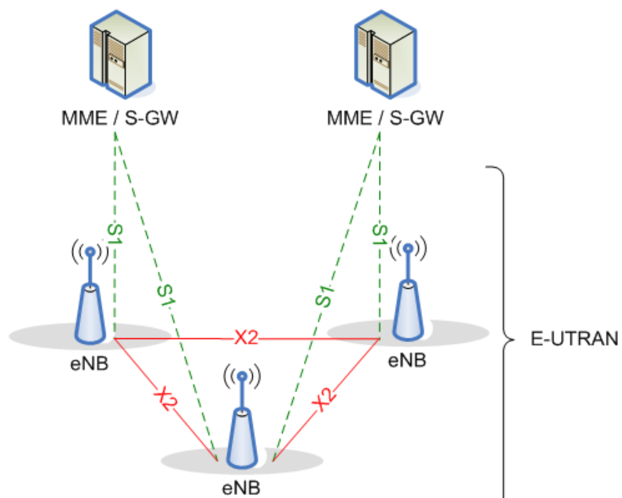


Figure 4-1: Overall Architecture

See e.g., 3GPP TS 36.300 V8.12.0 at pg. 15.

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:"

4.3.1 User plane

The figure below shows the protocol stack for the user-plane, where PDCP, RLC and MAC sublayers (terminated in eNB on the network side) perform the functions listed for the user plane in subclause 6, e.g. header compression, ciphering, scheduling, ARQ and HARQ;

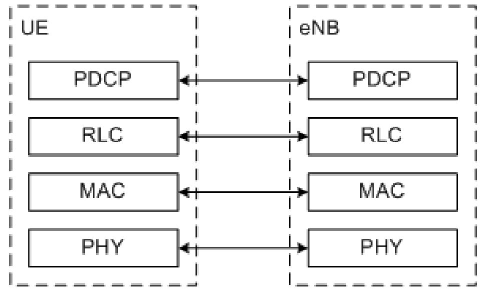


Figure 4.3.1-1: User-plane protocol stack

See e.g., 3GPP TS 36.300 V8.12.0 at pg. 18.

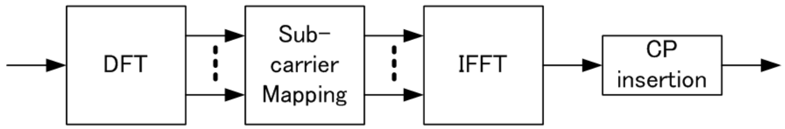
LTE uses OFDM for both the downlink and the uplink. For the uplink, LTE uses a specific type of OFDM referred to a discrete Fourier Transform Spread (DFTS)-OFDM.

5.1.1 Basic transmission scheme based on OFDM

The downlink transmission scheme is based on conventional OFDM using a cyclic prefix. The OFDM sub-carrier spacing is Δf = 15 kHz. 12 consecutive sub-carriers during one slot correspond to one downlink *resource block*. In the frequency domain, the number of resource blocks, N_{RB}, can range from $N_{RB\text{-}min}$ = 6 to $N_{RB\text{-}max}$ = 110.

See e.g., 3GPP TS 36.300 V8.12.0 at pg. 25.

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:"

	5.2.1 Basic transmission scheme For both FDD and TDD, the uplink transmission scheme is based on single-carrier FDMA, more specifically DFTS-OFDM.  **Figure 5.2.1-1: Transmitter scheme of SC-FDMA** See e.g., 3GPP TS 36.300 V8.12.0 at pg. 27.

U.S. Patent No. 10,771,302: Claim 23(a)

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:"

LTE uses an uplink channel bandwidth divided into physical resource blocks.

5.6 Channel bandwidth

Requirements in present document are specified for the channel bandwidths listed in Table 5.6-1.

Table 5.6-1 Transmission bandwidth configuration N_{RB} in E-UTRA channel bandwidths

Channel bandwidth $BW_{Channel}$ [MHz]	1.4	3	5	10	15	20
Transmission bandwidth configuration N_{RB}	6	15	25	50	75	100

Figure 5.6-1 shows the relation between the Channel bandwidth ($BW_{Channel}$) and the Transmission bandwidth configuration (N_{RB}). The channel edges are defined as the lowest and highest frequencies of the carrier separated by the channel bandwidth, i.e. at F_C +/- $BW_{Channel}$ /2.

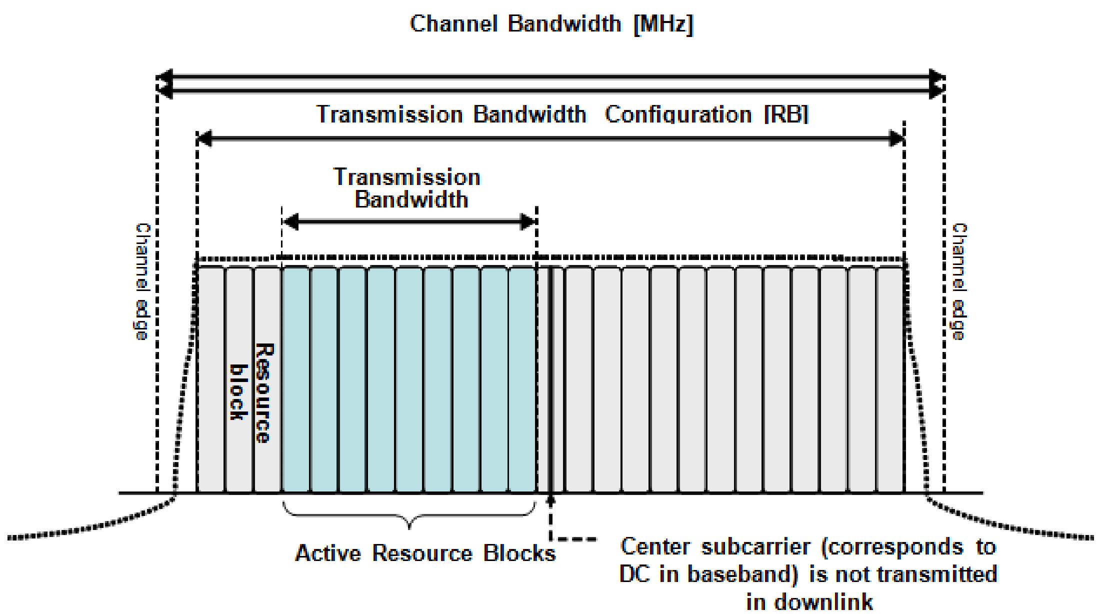


Figure 5.6-1 Definition of Channel Bandwidth and Transmission Bandwidth Configuration for one E-UTRA carrier

See e.g., 3GPP TS 36.101 V8.29.0 at pg. 15.

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:"

	Each physical resource block (PRB) has 12 subcarriers.

5.2.3 Resource blocks

A physical resource block is defined as $N_{\mathrm{symb}}^{\mathrm{UL}}$ consecutive SC-FDMA symbols in the time domain and $N_{\mathrm{sc}}^{\mathrm{RB}}$ consecutive subcarriers in the frequency domain, where $N_{\mathrm{symb}}^{\mathrm{UL}}$ and $N_{\mathrm{sc}}^{\mathrm{RB}}$ are given by Table 5.2.3-1. A physical resource block in the uplink thus consists of $N_{\mathrm{symb}}^{\mathrm{UL}} \times N_{\mathrm{sc}}^{\mathrm{RB}}$ resource elements, corresponding to one slot in the time domain and 180 kHz in the frequency domain.

Table 5.2.3-1: Resource block parameters.

Configuration	$N_{\mathrm{sc}}^{\mathrm{RB}}$	$N_{\mathrm{symb}}^{\mathrm{UL}}$
Normal cyclic prefix	12	7
Extended cyclic prefix	12	6

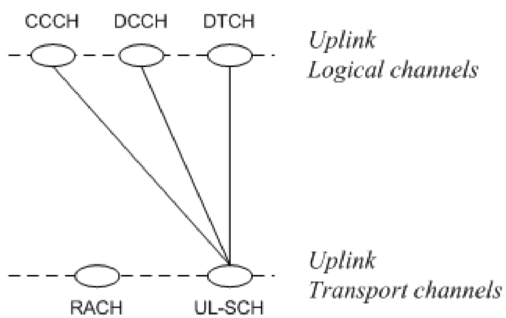
The relation between the physical resource block number n_{PRB} in the frequency domain and resource elements (k,l) in a slot is given by

$$n_{\mathrm{PRB}} = \left\lfloor \frac{k}{N_{\mathrm{sc}}^{\mathrm{RB}}} \right\rfloor$$

See e.g., 3GPP TS 36.211 V8.9.0 at pg. 13.

IP packets, voice and other user plane data is sent over dedicated traffic channels (DTCHs), which are sent over the uplink shared channel (UL-SCH) transport channel.

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:"

	6.1.2.2 Traffic Channels Traffic channels are used for the transfer of user plane information only. The traffic channels offered by MAC are: - **Dedicated Traffic Channel (DTCH)** A Dedicated Traffic Channel (DTCH) is a point-to-point channel, dedicated to one UE, for the transfer of user information. A DTCH can exist in both uplink and downlink. 6.1.3 Mapping between logical channels and transport channels 6.1.3.1 Mapping in Uplink The figure below depicts the mapping between uplink logical channels and uplink transport channels:  **Figure 6.1.3.1-1: Mapping between uplink logical channels and uplink transport channels** See e.g., 3GPP TS 36.300 V8.12.0 at pg. 34.

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:"

The UL-SCH transport channel is sent over the physical uplink shared channel (PUSCH) and control is sent over the physical uplink control channel (PUCCH).

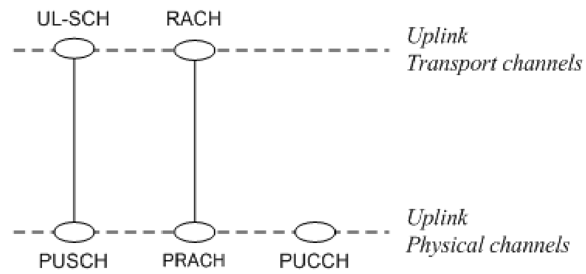


Figure 5.3.1-2: Mapping between uplink transport channels and uplink physical channels

See e.g., 3GPP TS 36.300 V8.12.0 at pg. 31.

5.4 Physical uplink control channel

The physical uplink control channel, PUCCH, carries uplink control information. The PUCCH is never transmitted simultaneously with the PUSCH from the same UE. For frame structure type 2, the PUCCH is not transmitted in the UpPTS field.

See e.g., 3GPP TS 36.211 V8.9.0 at pg. 16.

The PUCCH is transmitted using the outer PRBs/subcarriers of the uplink bandwidth and the PUSCH is transmitted using the PRBs/subcarriers between the PUCCH subcarriers.

5.4.3 Mapping to physical resources

The block of complex-valued symbols $z(i)$ shall be multiplied with the amplitude scaling factor β_{PUCCH} in order to conform to the transmit power P_{PUCCH} specified in Section 5.1.2.1 in [4], and mapped in sequence starting with $z(0)$ to resource elements. PUCCH uses one resource block in each of the two slots in a subframe. Within the physical resource block used for transmission, the mapping of $z(i)$ to resource elements (k,l) not used for transmission of reference signals shall be in increasing order of first k, then l and finally the slot number, starting with the first slot in the subframe.

See e.g., 3GPP TS 36.211 V8.9.0 at pg. 20.

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:"

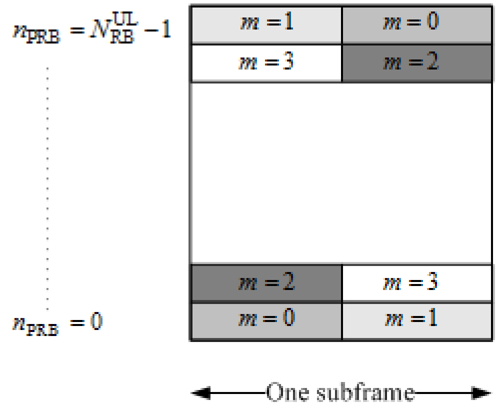


Figure 5.4.3-1: Mapping to physical resource blocks for PUCCH.

See e.g., 3GPP TS 36.211 V8.9.0 at pg. 21.

7.4.1.6. Resource-Block Mapping for PUCCH

The signals described for all of the PUCCH formats are, as already explained, transmitted on a (set of) resource-block pair. The resource-block pair to use is determined from the PUCCH resource index. Multiple resource-block pairs can be used to increase the control-signaling capacity in the cell; when one resource-block pair is full, the next PUCCH resource index is mapped to the next resource-block pair in sequence.

The resource-block pair(s) where a PUCCH is transmitted is located at the edges of the bandwidth allocated to the primary component carrier[25] as illustrated in Figure 7.28. To provide frequency diversity, frequency hopping on the slot boundary is used—that is, one "frequency resource" consists of 12 (or more in case of PUCCH format 4) subcarriers at the upper part of the spectrum within the first slot of a subframe and an equally sized resource at the lower part of the spectrum during the second slot of the subframe (or vice versa).

The reason for locating the PUCCH resources at the edges of the overall available spectrum is twofold:

- Together with the frequency hopping described previously, this maximizes the frequency diversity experienced by the control signaling.
- Assigning uplink resources for the PUCCH at other positions within the spectrum—that is, not at the edges—would have fragmented the uplink spectrum, making it impossible to assign very wide transmission bandwidths to a single device and still preserve the low-cubic-metric properties of the uplink transmission.

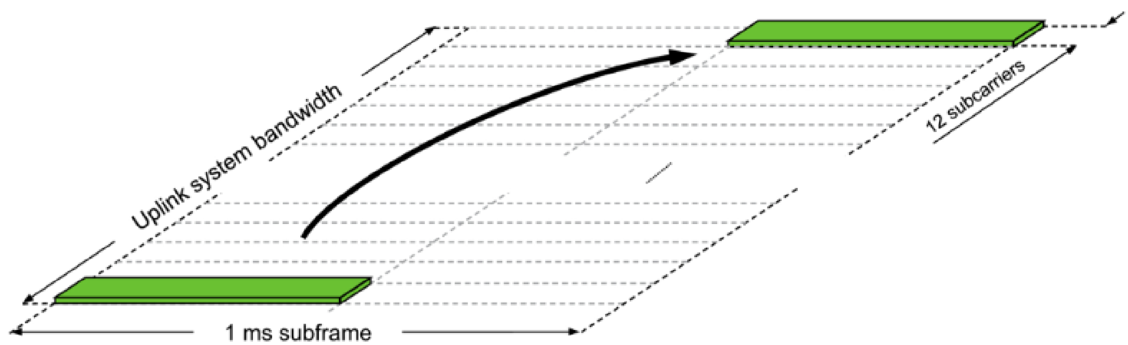
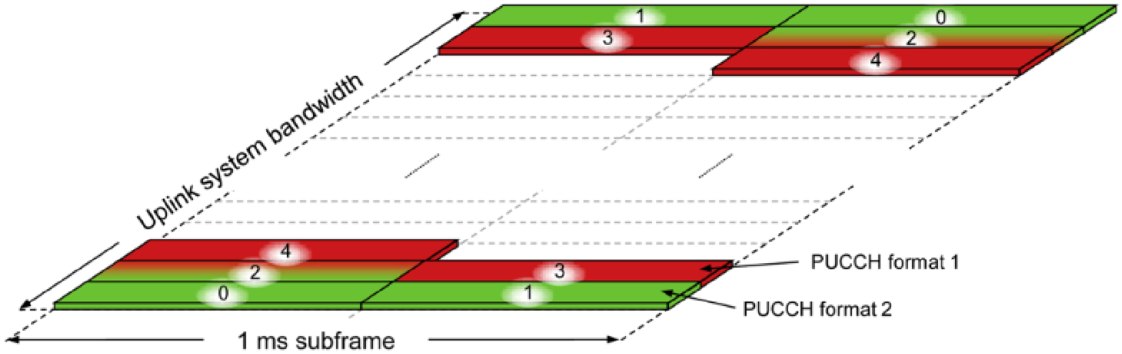


Figure 7.28 Uplink L1/L2 control signaling transmission on PUCCH.

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:"

	 Figure 7.29 Allocation of resource blocks for PUCCH. The resource-block mapping is in principle done such that PUCCH format 2 (CSI reports) is transmitted closest to the edges of the uplink cell bandwidth with PUCCH format 1 (hybrid-ARQ acknowledgments, scheduling requests) next as illustrated in Figure 7.29. The locations of PUCCH formats 3, 4, and 5 are configurable and can, for example, be located between formats 1 and 2. A semi-static parameter, provided as part of the system information, controls on which resource-block pair the mapping of PUCCH format 1 starts. Furthermore, the semi-statically configured scheduling requests are located at the outermost parts of the format 1 resources, leaving dynamic acknowledgments closest to the data. As the amount of resources necessary for hybrid-ARQ acknowledgments varies dynamically, this maximizes the amount of contiguous spectrum available for PUSCH. In many scenarios, the configuration of the PUCCH resources can be done such that the three PUCCH formats are transmitted on separate sets of resource blocks. However, for the smallest cell bandwidths, this would result in too high an overhead. Therefore, it is possible to mix PUCCH formats 1 and 2 in one of the resource-block pairs—for example, in Figure 7.29 this is the case for the resource-block pair denoted "2." Although this mixture is primarily motivated by the smaller cell bandwidths, it can equally well be used for the larger cell bandwidths. In the resource-block pair where PUCCH formats 1 and 2 are mixed, the set of possible phase rotations are split between the two formats. Furthermore, some of the phase rotations are reserved as "guard"; hence the efficiency of such a mixed resource-block pair is slightly lower than a resource-block pair carrying only one of the first two PUCCH formats. See e.g., 4G LTE=Advanced Pro and The Road to 5G, Third Edition, Dahlman et al, §7.4.1.6.

U.S. Patent No. 10,771,302: Claim 23(b)

" a receiver configured to receive a request for a probing signal from a base station in the system;"

a receiver configured to receive a request for a probing signal from a base station in the system;	Toyota's Accused Products include a receiver configured to receive a request for a probing signal from a base station in the system. *E.g.*,
	
	For example, for periodic SRS the UE receives from the eNB an RRC message (RRCConnectionReconfiguration message or SystemInformation message) including SRS configuration parameters in the *SoundingRS-UL-Config* information element, which instructs the UE to periodically transmit SRS.
	
	– *RRCConnectionReconfiguration*
	
	The *RRCConnectionReconfiguration* message is the command to modify an RRC connection. It may convey information for measurement configuration, mobility control, radio resource configuration (including RBs, MAC main configuration and physical channel configuration) including any associated dedicated NAS information and security configuration.
	
	Signalling radio bearer: SRB1
	
	RLC-SAP: AM
	
	Logical channel: DCCH
	
	Direction: E-UTRAN to UE
	
	***RRCConnectionReconfiguration* message**
	
	-- ASN1START
	
	RRCConnectionReconfiguration ::= SEQUENCE {
	rrc-TransactionIdentifier RRC-TransactionIdentifier,
	criticalExtensions CHOICE {
	c1 CHOICE{
	rrcConnectionReconfiguration-r8 RRCConnectionReconfiguration-r8-IEs,
	spare7 NULL,
	spare6 NULL, spare5 NULL, spare4 NULL,
	spare3 NULL, spare2 NULL, spare1 NULL
	},
	criticalExtensionsFuture SEQUENCE {}
	}
	}
	
	RRCConnectionReconfiguration-r8-IEs ::= SEQUENCE {
	measConfig MeasConfig OPTIONAL, -- Need ON
	mobilityControlInfo MobilityControlInfo OPTIONAL, -- Cond HO
	dedicatedInfoNASList SEQUENCE (SIZE(1..maxDRB)) OF
	DedicatedInfoNAS OPTIONAL, -- Cond nonHO
	radioResourceConfigDedicated RadioResourceConfigDedicated OPTIONAL, -- Cond HO-toEUTRA
	securityConfigHO SecurityConfigHO OPTIONAL, -- Cond HO
	nonCriticalExtension SEQUENCE {} OPTIONAL -- Need OP
	}

" a receiver configured to receive a request for a probing signal from a base station in the system;"

	See e.g., 3GPP TS 36.331 V8.21.0 at p. 89.
	
	– *RadioResourceConfigDedicated*
	
	The IE *RadioResourceConfigDedicated* is used to setup/modify/release RBs, to modify the MAC main configuration, to modify the SPS configuration and to modify dedicated physical configuration.
	
	***RadioResourceConfigDedicated* information element**
	
	-- ASN1START
	
	RadioResourceConfigDedicated ::= SEQUENCE {
	srb-ToAddModList SRB-ToAddModList OPTIONAL, -- Cond HO-Conn
	drb-ToAddModList DRB-ToAddModList OPTIONAL, -- Cond HO-toEUTRA
	drb-ToReleaseList DRB-ToReleaseList OPTIONAL, -- Need ON
	mac-MainConfig CHOICE {
	explicitValue MAC-MainConfig,
	defaultValue NULL
	} OPTIONAL, -- Cond HO-toEUTRA2
	sps-Config SPS-Config OPTIONAL, -- Need ON
	physicalConfigDedicated PhysicalConfigDedicated OPTIONAL, -- Need ON
	...
	}
	
	See e.g., 3GPP TS 36.331 V8.21.0 at p. 129.
	
	– *PhysicalConfigDedicated*
	
	The IE *PhysicalConfigDedicated* is used to specify the UE specific physical channel configuration.
	
	***PhysicalConfigDedicated* information element**
	
	-- ASN1START
	
	PhysicalConfigDedicated ::= SEQUENCE {
	pdsch-ConfigDedicated PDSCH-ConfigDedicated OPTIONAL, -- Need ON
	pucch-ConfigDedicated PUCCH-ConfigDedicated OPTIONAL, -- Need ON
	pusch-ConfigDedicated PUSCH-ConfigDedicated OPTIONAL, -- Need ON
	uplinkPowerControlDedicated UplinkPowerControlDedicated OPTIONAL, -- Need ON
	tpc-PDCCH-ConfigPUCCH TPC-PDCCH-Config OPTIONAL, -- Need ON
	tpc-PDCCH-ConfigPUSCH TPC-PDCCH-Config OPTIONAL, -- Need ON
	cqi-ReportConfig CQI-ReportConfig OPTIONAL, -- Need ON
	soundingRS-UL-ConfigDedicated SoundingRS-UL-ConfigDedicated OPTIONAL, -- Need ON
	antennaInfo CHOICE {
	explicitValue AntennaInfoDedicated,
	defaultValue NULL
	} OPTIONAL, -- Need ON
	schedulingRequestConfig SchedulingRequestConfig OPTIONAL, -- Need ON
	...
	}
	
	-- ASN1STOP
	
	See e.g., 3GPP TS 36.331 V8.21.0 at p. 122.

U.S. Patent No. 10,771,302: Claim 23(b)

" a receiver configured to receive a request for a probing signal from a base station in the system;”

	Direction: E-UTRAN to UE
	***SystemInformation* message**
	`-- ASN1START`
	`SystemInformation ::= SEQUENCE {`
	`criticalExtensions CHOICE {`
	`systemInformation-r8 SystemInformation-r8-IEs,`
	`criticalExtensionsFuture SEQUENCE {}`
	`}`
	`}`
	`SystemInformation-r8-IEs ::= SEQUENCE {`
	`sib-TypeAndInfo SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {`
	`sib2 SystemInformationBlockType2,`
	`sib3 SystemInformationBlockType3,`
	`sib4 SystemInformationBlockType4,`
	`sib5 SystemInformationBlockType5,`
	`sib6 SystemInformationBlockType6,`
	`sib7 SystemInformationBlockType7,`
	`sib8 SystemInformationBlockType8,`
	`sib9 SystemInformationBlockType9,`
	`sib10 SystemInformationBlockType10,`
	`sib11 SystemInformationBlockType11,`
	`...`
	`},`
	`nonCriticalExtension SEQUENCE {} OPTIONAL -- Need OP`
	`}`
	`-- ASN1STOP`
	See e.g., 3GPP TS 36.331 V8.21.0 at p. 100.

U.S. Patent No. 10,771,302: Claim 23(b)

" a receiver configured to receive a request for a probing signal from a base station in the system;"

	6.3.1 System information blocks
	
	– *SystemInformationBlockType2*
	
	The IE *SystemInformationBlockType2* contains radio resource configuration information that is common for all UEs.
	
	NOTE: UE timers and constants related to functionality for which parameters are provided in another SIB are included in the corresponding SIB.
	
	***SystemInformationBlockType2* information element**
	
	`-- ASN1START`
	
	`SystemInformationBlockType2 ::=     SEQUENCE {`
	`    ac-BarringInfo                      SEQUENCE {`
	`        ac-BarringForEmergency              BOOLEAN,`
	`        ac-BarringForMO-Signalling          AC-BarringConfig                OPTIONAL,   -- Need OP`
	`        ac-BarringForMO-Data                AC-BarringConfig                OPTIONAL    -- Need OP`
	`    }                                                                       OPTIONAL,   -- Need OP`
	`    radioResourceConfigCommon           RadioResourceConfigCommonSIB,`
	`    ue-TimersAndConstants               UE-TimersAndConstants,`
	`    freqInfo                            SEQUENCE {`
	`        ul-CarrierFreq                      ARFCN-ValueEUTRA                OPTIONAL,   -- Need OP`
	`        ul-Bandwidth                        ENUMERATED {n6, n15, n25, n50, n75, n100}`
	`                                                                            OPTIONAL,   -- Need OP`
	`        additionalSpectrumEmission          AdditionalSpectrumEmission`
	`    },`
	`    mbsfn-SubframeConfigList            MBSFN-SubframeConfigList            OPTIONAL,   -- Need OR`
	`    timeAlignmentTimerCommon            TimeAlignmentTimer,`
	`    ...,`
	`    lateNonCriticalExtension        OCTET STRING (CONTAINING SystemInformationBlockType2-v8h0-IEs)`
	`                            OPTIONAL    -- Need OP`
	`}`
	
	See e.g., 3GPP TS 36.331 V8.21.0 at p. 105.

U.S. Patent No. 10,771,302: Claim 23(b)

" a receiver configured to receive a request for a probing signal from a base station in the system;"

	***RadioResourceConfigCommon* information element**

```
-- ASN1START

RadioResourceConfigCommonSIB ::=    SEQUENCE {
    rach-ConfigCommon                   RACH-ConfigCommon,
    bcch-Config                         BCCH-Config,
    pcch-Config                         PCCH-Config,
    prach-Config                        PRACH-ConfigSIB,
    pdsch-ConfigCommon                  PDSCH-ConfigCommon,
    pusch-ConfigCommon                  PUSCH-ConfigCommon,
    pucch-ConfigCommon                  PUCCH-ConfigCommon,
    soundingRS-UL-ConfigCommon          SoundingRS-UL-ConfigCommon,
    uplinkPowerControlCommon            UplinkPowerControlCommon,
    ul-CyclicPrefixLength               UL-CyclicPrefixLength,
    ...
}

RadioResourceConfigCommon ::=       SEQUENCE {
    rach-ConfigCommon                   RACH-ConfigCommon                   OPTIONAL,   -- Need ON
    prach-Config                        PRACH-Config,
    pdsch-ConfigCommon                  PDSCH-ConfigCommon                  OPTIONAL,   -- Need ON
    pusch-ConfigCommon                  PUSCH-ConfigCommon,
    phich-Config                        PHICH-Config                        OPTIONAL,   -- Need ON
    pucch-ConfigCommon                  PUCCH-ConfigCommon                  OPTIONAL,   -- Need ON
    soundingRS-UL-ConfigCommon          SoundingRS-UL-ConfigCommon          OPTIONAL,   -- Need ON
    uplinkPowerControlCommon            UplinkPowerControlCommon            OPTIONAL,   -- Need ON
    antennaInfoCommon                   AntennaInfoCommon           OPTIONAL,   -- Need ON
    p-Max                               P-Max                               OPTIONAL,   -- Need OP
    tdd-Config                          TDD-Config                          OPTIONAL,   -- Cond TDD
    ul-CyclicPrefixLength               UL-CyclicPrefixLength,
    ...
}
```

See e.g., 3GPP TS 36.331 V8.21.0 at p. 128.

" a receiver configured to receive a request for a probing signal from a base station in the system;"

	– *SoundingRS-UL-Config*
	
	The IE *SoundingRS-UL-Config* is used to specify the uplink Sounding RS configuration.
	
	***SoundingRS-UL-Config* information element**
	
	`-- ASN1START`
	
	`SoundingRS-UL-ConfigCommon ::= CHOICE {`
	`release NULL,`
	`setup SEQUENCE {`
	`srs-BandwidthConfig ENUMERATED {bw0, bw1, bw2, bw3, bw4, bw5, bw6, bw7},`
	`srs-SubframeConfig ENUMERATED {`
	`sc0, sc1, sc2, sc3, sc4, sc5, sc6, sc7,`
	`sc8, sc9, sc10, sc11, sc12, sc13, sc14, sc15},`
	`ackNackSRS-SimultaneousTransmission BOOLEAN,`
	`srs-MaxUpPts ENUMERATED {true} OPTIONAL -- Cond TDD`
	`}`
	`}`
	
	`SoundingRS-UL-ConfigDedicated ::= CHOICE{`
	`release NULL,`
	`setup SEQUENCE {`
	`srs-Bandwidth ENUMERATED {bw0, bw1, bw2, bw3},`
	`srs-HoppingBandwidth ENUMERATED {hbw0, hbw1, hbw2, hbw3},`
	`freqDomainPosition INTEGER (0..23),`
	`duration BOOLEAN,`
	`srs-ConfigIndex INTEGER (0..1023),`
	`transmissionComb INTEGER (0..1),`
	`cyclicShift ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}`
	`}`
	`}`
	
	`-- ASN1STOP`
	
	3GPP TS 36.331 V8.21.0 at p. 132.
	
	For LTE-A UEs, those UEs can also be instructed to send an aperiodic SRS by the eNB as part of downlink control information (DCI) formats 0, 1A, 2B, 2C, and 4.
	
	A UE shall transmit Sounding Reference Symbol (SRS) on per serving cell SRS resources based on two trigger types:
	
	- trigger type 0: higher layer signalling
	
	- trigger type 1: DCI formats 0/4/1A for FDD and TDD and DCI formats 2B/2C for TDD.
	
	See e.g., 3GPP TS 36.213 V10.13.0 at pg. 81.

" a receiver configured to receive a request for a probing signal from a base station in the system;"

	- SRS request – 0 or 1 bit. This field can only be present in DCI formats scheduling PUSCH which are mapped onto the UE specific search space given by the C-RNTI as defined in [3]. The interpretation of this field is provided in section 8.2 of [3] See e.g., 3GPP TS 36.212 V10.9.0 at pg. 58. - SRS request – 0 or 1 bit. This field can only be present in DCI formats scheduling PDSCH which are mapped onto the UE specific search space given by the C-RNTI as defined in [3]. The interpretation of this field is provided in section 8.2 of [3] See e.g., 3GPP TS 36.212 V10.9.0 at pg. 60.

U.S. Patent No. 10,771,302: Claim 23(c)

"a transmitter configured to form and transmit, in response to the received request, the probing signal with a code sequence modulated in the frequency domain, wherein:"

a transmitter configured to form and transmit, in response to the received request, the probing signal with a code sequence modulated in the frequency domain, wherein:	Toyota's Accused Products each include a transmitter configured to form and transmit the probing signal with a code sequence modulated in the frequency domain. *E.g.,* For example, in response to the RRC signaling (periodic SRS) or the SRS request (aperiodic SRS), the UE generates a phase shifted SRS sequence that is modulated onto subcarriers in the frequency domain. **5.5 Reference signals** Two types of uplink reference signals are supported: - Demodulation reference signal, associated with transmission of PUSCH or PUCCH - Sounding reference signal, not associated with transmission of PUSCH or PUCCH The same set of base sequences is used for demodulation and sounding reference signals. **5.5.1 Generation of the reference signal sequence** Reference signal sequence $r_{u,v}^{(\alpha)}(n)$ is defined by a cyclic shift α of a base sequence $\bar{r}_{u,v}(n)$ according to $r_{u,v}^{(\alpha)}(n) = e^{j\alpha n}\bar{r}_{u,v}(n), \quad 0 \le n < M_{sc}^{RS}$ where $M_{sc}^{RS} = mN_{sc}^{RB}$ is the length of the reference signal sequence and $1 \le m \le N_{RB}^{max,UL}$. Multiple reference signal sequences are defined from a single base sequence through different values of α. Base sequences $\bar{r}_{u,v}(n)$ are divided into groups, where $u \in \{0,1,...,29\}$ is the group number and v is the base sequence number within the group, such that each group contains one base sequence ($v=0$) of each length $M_{sc}^{RS} = mN_{sc}^{RB}$, $1 \le m \le 5$ and two base sequences ($v = 0,1$) of each length $M_{sc}^{RS} = mN_{sc}^{RB}$, $6 \le m \le N_{RB}^{max,UL}$. The sequence group number u and the number v within the group may vary in time as described in Sections 5.5.1.3 and 5.5.1.4, respectively. The definition of the base sequence $\bar{r}_{u,v}(0),..., \bar{r}_{u,v}(M_{sc}^{RS}-1)$ depends on the sequence length M_{sc}^{RS}. See e.g., 3GPP TS 36.211 V8.9.0 at pg. 21.

U.S. Patent No. 10,771,302: Claim 23(c)

"a transmitter configured to form and transmit, in response to the received request, the probing signal with a code sequence modulated in the frequency domain, wherein:"

	5.5.3 Sounding reference signal **5.5.3.1 Sequence generation** The sounding reference signal sequence $r^{\mathrm{SRS}}(n)=r_{u,v}^{(\alpha)}(n)$ is defined by Section 5.5.1, where u is the PUCCH sequence-group number defined in Section 5.5.1.3 and v is the base sequence number defined in Section 5.5.1.4. The cyclic shift α of the sounding reference signal is given as $$\alpha = 2\pi \frac{n_{\mathrm{SRS}}^{\mathrm{cs}}}{8},$$ where $n_{\mathrm{SRS}}^{\mathrm{cs}}$ is configured for each UE by higher layers and $n_{\mathrm{SRS}}^{\mathrm{cs}} = 0,1,2,3,4,5,6,7$. **5.5.3.2 Mapping to physical resources** The sequence shall be multiplied with the amplitude scaling factor β_{SRS} in order to conform to the transmit power P_{SRS} specified in Section 5.1.3.1 in [4], and mapped in sequence starting with $r^{\mathrm{SRS}}(0)$ to resource elements (k,l) according to $$a_{2k+k_0,l} = \begin{cases} \beta_{\mathrm{SRS}} r^{\mathrm{SRS}}(k) & k = 0,1,\ldots,M_{\mathrm{sc},b}^{\mathrm{RS}}-1 \\ 0 & \text{otherwise} \end{cases}$$ where k_0 is the frequency-domain starting position of the sounding reference signal and for $b = B_{SRS}$ $M_{\mathrm{sc},b}^{\mathrm{RS}}$ is the length of the sounding reference signal sequence defined as $$M_{\mathrm{sc},b}^{\mathrm{RS}} = m_{\mathrm{SRS},b} N_{\mathrm{sc}}^{\mathrm{RB}} / 2$$ See e.g., 3GPP TS 36.211 V8.9.0 at pg. 28. The UE transmits the SRS to the eNodeB. **5.5.3.3 Sounding reference signal subframe configuration** The cell specific subframe configuration period T_{SFC} and the cell specific subframe offset Δ_{SFC} for the transmission of sounding reference signals are listed in Tables 5.5.3.3-1 and 5.5.3.3-2, for FDD and TDD, respectively. Sounding reference signal subframes are the subframes satisfying $\lfloor n_s/2 \rfloor \bmod T_{SFC} \in \Delta_{SFC}$. For TDD, sounding reference signal is transmitted only in configured UL subframes or UpPTS.

"a transmitter configured to form and transmit, in response to the received request, the probing signal with a code sequence modulated in the frequency domain, wherein:"

	See e.g., 3GPP TS 36.211 V8.9.0 at pg. 31.

U.S. Patent No. 10,771,302: Claim 23(d)
" the probing signal is configured to overlap, in the time domain, with uplink signals transmitted over an uplink frequency band by other mobile devices in the system; and"

the probing signal is configured to overlap, in the time domain, with uplink signals transmitted over an uplink frequency band by other mobile devices in the system; and	The probing signal transmitted by Toyota's Accused Products is configured to overlap, in the time domain, with uplink signals transmitted over an uplink frequency band by other mobile devices in the system. *E.g.,* For example, the SRS is mapped to one symbol in the time domain but over many subcarriers in the frequency domain, and overlaps with PUCCH in the time domain. **5.5.3 Sounding reference signal** **5.5.3.1 Sequence generation** The sounding reference signal sequence $r^{\mathrm{SRS}}(n) = r_{u,v}^{(\alpha)}(n)$ is defined by Section 5.5.1, where u is the PUCCH sequence-group number defined in Section 5.5.1.3 and v is the base sequence number defined in Section 5.5.1.4. The cyclic shift α of the sounding reference signal is given as $$\alpha = 2\pi \frac{n_{\mathrm{SRS}}^{\mathrm{cs}}}{8},$$ where $n_{\mathrm{SRS}}^{\mathrm{cs}}$ is configured for each UE by higher layers and $n_{\mathrm{SRS}}^{\mathrm{cs}} = 0,1,2,3,4,5,6,7$. **5.5.3.2 Mapping to physical resources** The sequence shall be multiplied with the amplitude scaling factor β_{SRS} in order to conform to the transmit power P_{SRS} specified in Section 5.1.3.1 in [4], and mapped in sequence starting with $r^{\mathrm{SRS}}(0)$ to resource elements (k,l) according to $$a_{2k+k_0,l} = \begin{cases} \beta_{\mathrm{SRS}} r^{\mathrm{SRS}}(k) & k = 0,1,\ldots,M_{\mathrm{sc},b}^{\mathrm{RS}} - 1 \\ 0 & \text{otherwise} \end{cases}$$ where k_0 is the frequency-domain starting position of the sounding reference signal and for $b = B_{SRS}$ $M_{\mathrm{sc},b}^{\mathrm{RS}}$ is the length of the sounding reference signal sequence defined as $$M_{\mathrm{sc},b}^{\mathrm{RS}} = m_{\mathrm{SRS},b} N_{\mathrm{sc}}^{\mathrm{RB}} / 2$$ See e.g., 3GPP TS 36.211 V8.9.0 at pg. 28.

U.S. Patent No. 10,771,302: Claim 23(d)
" the probing signal is configured to overlap, in the time domain, with uplink signals transmitted over an uplink frequency band by other mobile devices in the system; and"

The UE transmits the SRS to the eNodeB.

5.5.3.3 Sounding reference signal subframe configuration

The cell specific subframe configuration period T_{SFC} and the cell specific subframe offset Δ_{SFC} for the transmission of sounding reference signals are listed in Tables 5.5.3.3-1 and 5.5.3.3-2, for FDD and TDD, respectively. Sounding reference signal subframes are the subframes satisfying $\lfloor n_s / 2 \rfloor \bmod T_{SFC} \in \Delta_{SFC}$. For TDD, sounding reference signal is transmitted only in configured UL subframes or UpPTS.

See e.g., 3GPP TS 36.211 V8.9.0 at pg. 31.

In case of simultaneous transmission of sounding reference signal and PUCCH format 1, 1a or 1b, one SC-FDMA symbol on PUCCH shall punctured.

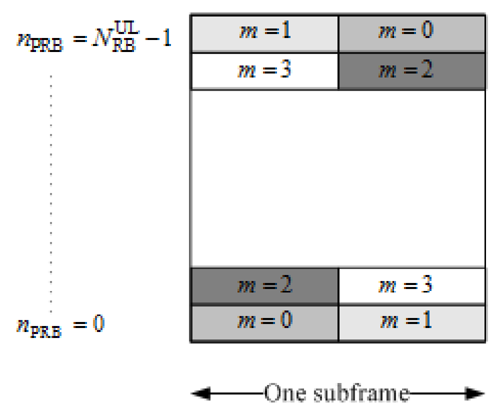


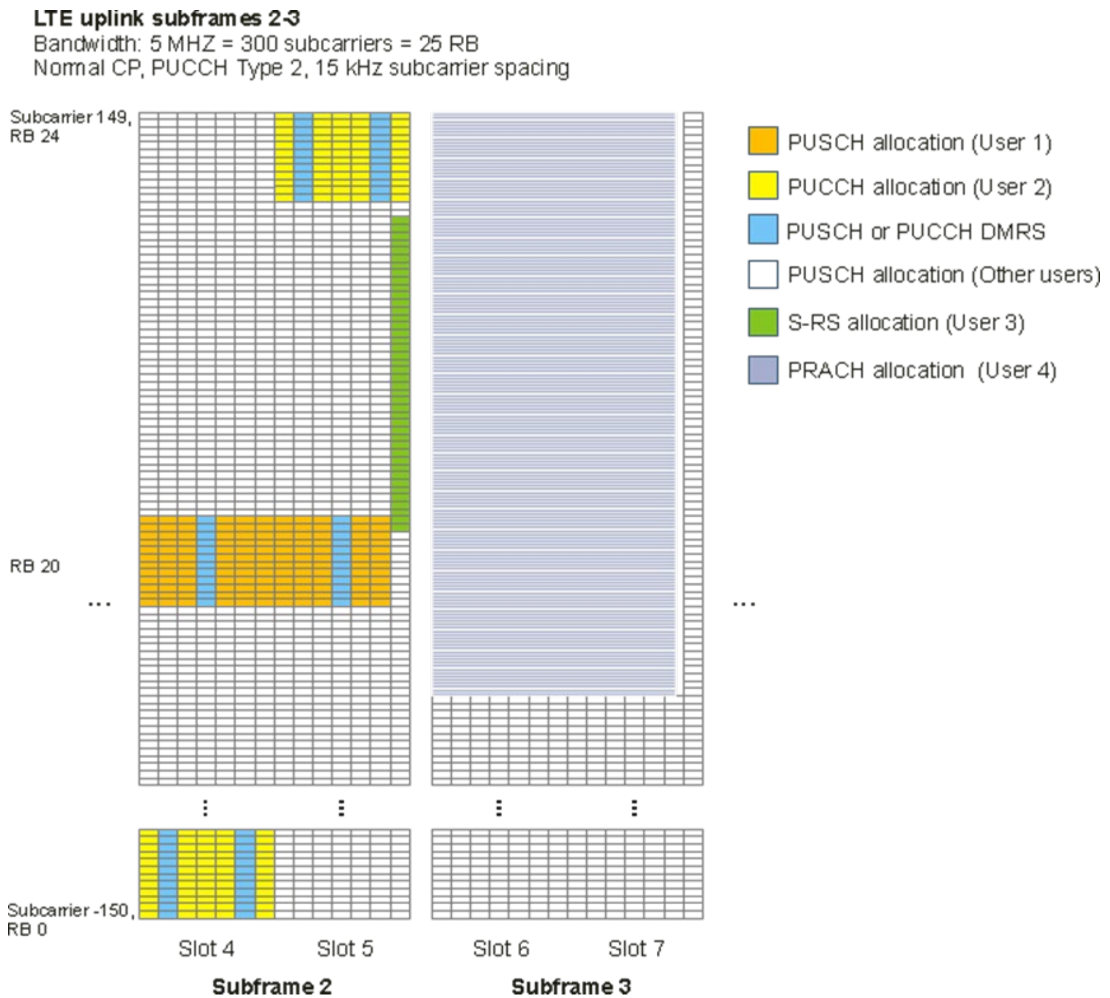
Figure 5.4.3-1: Mapping to physical resource blocks for PUCCH.

See e.g., 3GPP TS 36.211 V8.9.0 at pg. 21.

For all subframes other than special subframes, the sounding reference signal shall be transmitted in the last symbol of the subframe.

See e.g., 3GPP TS 36.211 V8.9.0 at pg. 30.

U.S. Patent No. 10,771,302: Claim 23(d)
" the probing signal is configured to overlap, in the time domain, with uplink signals transmitted over an uplink frequency band by other mobile devices in the system; and"

	 See e.g., http://rfmw.em.keysight.com/wireless/helpfiles/89600b/webhelp/subsystems/lte/content/lte_overview.htm

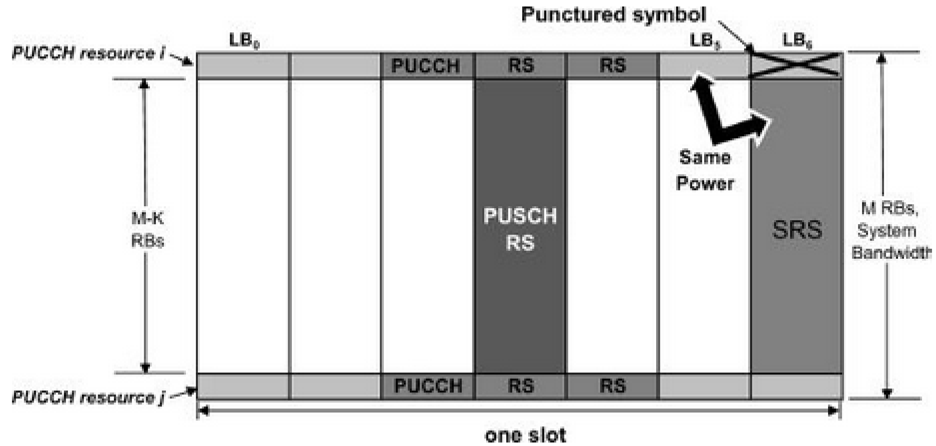
U.S. Patent No. 10,771,302: Claim 23(e)
" the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system."

the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system.	The probing signal transmitted by Toyota's Accused Products is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system.. *E.g.,* For example, SRS transmissions are sent using a portion of the uplink bandwidth. **8.2 UE sounding procedure** The following Sounding Reference Symbol (SRS) parameters are UE specific semi-statically configurable by higher layers: • Transmission comb k_{TC}, as defined in Section 5.5.3.2 of [3] • Starting physical resource block assignment n_{RRC}, as defined in Section 5.5.3.2 of [3] • Duration of SRS transmission: single or indefinite (until disabled), as defined in [11] • SRS configuration index I_{SRS} for SRS periodicity and SRS subframe offset T_{offset}, as defined in Table 8.2-1 and Table 8.2-2 • SRS bandwidth B_{SRS}, as defined in Section 5.5.3.2 of [3] • Frequency hopping bandwidth, b_{hop}, as defined in Section 5.5.3.2 of [3] • Cyclic shift n_{SRS}^{cs}, as defined in Section 5.5.3.2 of [3] The cell specific SRS transmission bandwidths C_{SRS} are configured by higher layers. The allowable values are given in Section 5.5.3.2 of [3]. See e.g., 3GPP TS 36.213 V8.8.0 at pg. 55. SRS does not overlap in the frequency domain with PUCCH subcarriers.

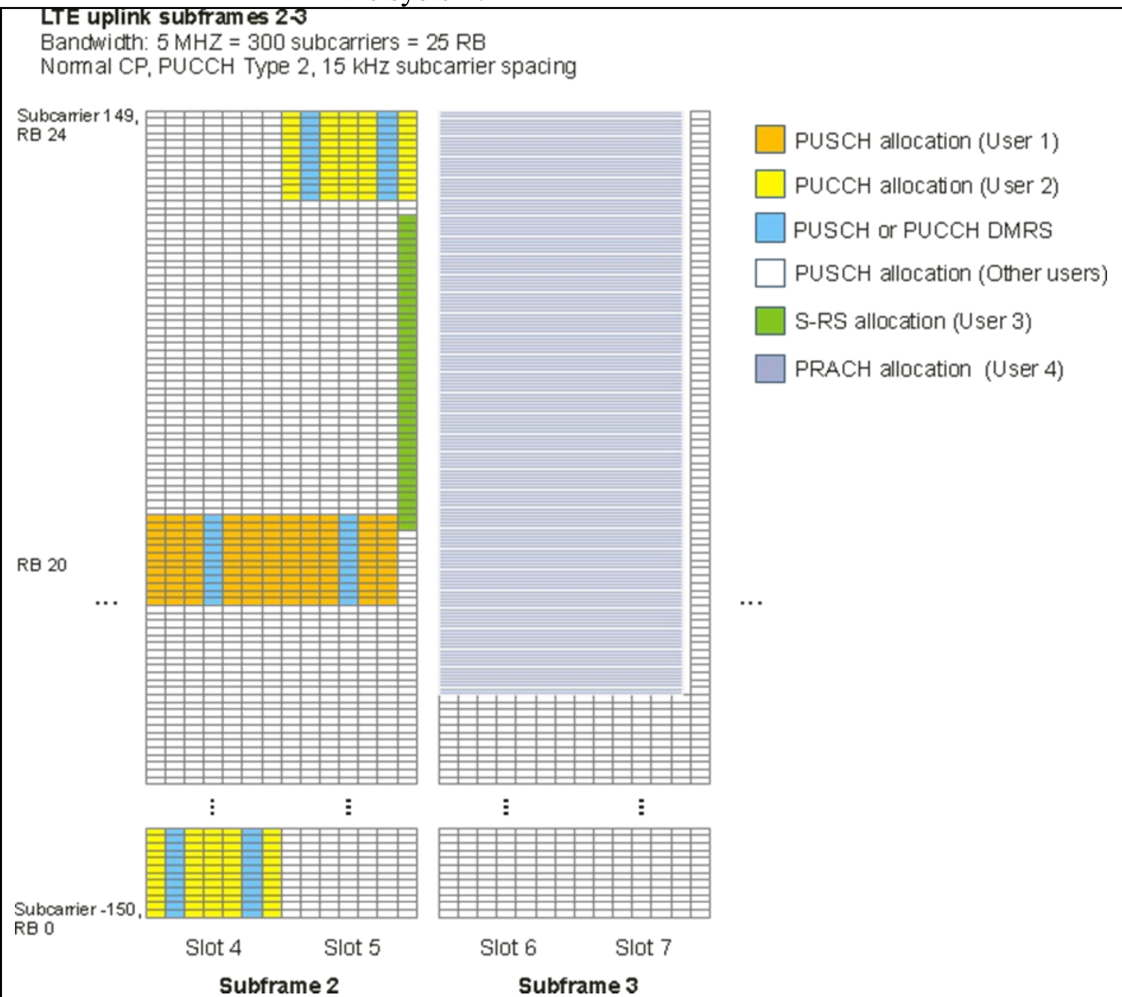
U.S. Patent No. 10,771,302: Claim 23(e)
" the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system."

	15.6.3.1 SRS Bandwidths Some of the factors which affect the SRS bandwidth are the maximum power of the UE, the number of supportable sounding UEs, and the sounding bandwidth needed to benefit from uplink channel-dependent scheduling. Full bandwidth sounding provides the most complete channel information when the UE is sufficiently close to the eNodeB, but degrades as the path-loss increases when the UE cannot further increase its transmit power to maintain the transmission across the full bandwidth. Full bandwidth transmission of SRS also limits the number of simultaneous UEs whose channels can be sounded, due to the limited number of cyclic time shifts (eight cyclic time shifts per SRS comb as explained above). To improve the SNR and support a larger number of SRSs, up to four SRS bandwidths can be simultaneously supported in LTE depending on the system bandwidth. To provide flexibility with the values for the SRS bandwidths, eight sets of four SRS bandwidths are defined for each possible system bandwidth. RRC signalling indicates which of the eight sets is applicable in the cell by means of a 3-bit cell-specific parameter 'srs-BandwidthConfig'. This allows some variability in the maximum SRS bandwidths, which is important as the SRS region does not include the PUCCH region near the edges of the system bandwidth (see Section 16.3), which is itself variable in bandwidth. An example of the eight sets of four SRS bandwidths applicable to uplink system bandwidths in the range 40–60 RBs is shown in Table 15.1 (see [4, Table 5.5.3.2–2]). See Sesia, Toufik and Baker, "LTE: The UMTS Long Term Evolution From Theory to Practice", at p. 338. **Figure 16.13:** A UE may not simultaneously transmit on SRS and PUCCH or PUSCH, in order to avoid violating the single-carrier nature of the signal. Therefore, a PUCCH or PUSCH symbol may be punctured if SRS is transmitted.

U.S. Patent No. 10,771,302: Claim 23(e)
" the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system."

	 See e.g., Sesia, Toufik and Baker, "LTE: The UMTS Long Term Evolution From Theory to Practice", at p. 358.

U.S. Patent No. 10,771,302: Claim 23(e)
" the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system."

	 See e.g., http://rfmw.em.keysight.com/wireless/helpfiles/89600b/webhelp/subsystems/lte/content/lte_overview.htm For example, the PUCCH is mapped into a resource block a single resource block in each time slot that is located near the top or the bottom of the uplink bandwidth.

U.S. Patent No. 10,771,302: Claim 23(e)
" the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system."

	5.4.3 Mapping to physical resources The block of complex-valued symbols $z(i)$ shall be multiplied with the amplitude scaling factor β_{PUCCH} in order to conform to the transmit power P_{PUCCH} specified in Section 5.1.2.1 in [4], and mapped in sequence starting with $z(0)$ to resource elements. PUCCH uses one resource block in each of the two slots in a subframe. Within the physical resource block used for transmission, the mapping of $z(i)$ to resource elements (k,l) not used for transmission of reference signals shall be in increasing order of first k, then l and finally the slot number, starting with the first slot in the subframe. The physical resource blocks to be used for transmission of PUCCH in slot n_s is given by $$n_{\text{PRB}} = \begin{cases} \left\lfloor \frac{m}{2} \right\rfloor & \text{if } (m + n_s \bmod 2) \bmod 2 = 0 \\ N_{\text{RB}}^{\text{UL}} - 1 - \left\lfloor \frac{m}{2} \right\rfloor & \text{if } (m + n_s \bmod 2) \bmod 2 = 1 \end{cases}$$ where the variable m depends on the PUCCH format. For formats 1, 1a and 1b

U.S. Patent No. 10,771,302: Claim 23(e)
" the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system."

$$m = \begin{cases} N_{\mathrm{RB}}^{(2)} & \text{if } n_{\mathrm{PUCCH}}^{(1)} < c \cdot N_{\mathrm{cs}}^{(1)} / \Delta_{\mathrm{shift}}^{\mathrm{PUCCH}} \\ \left\lfloor \dfrac{n_{\mathrm{PUCCH}}^{(1)} - c \cdot N_{\mathrm{cs}}^{(1)} / \Delta_{\mathrm{shift}}^{\mathrm{PUCCH}}}{c \cdot N_{\mathrm{sc}}^{\mathrm{RB}} / \Delta_{\mathrm{shift}}^{\mathrm{PUCCH}}} \right\rfloor + N_{\mathrm{RB}}^{(2)} + \left\lceil \dfrac{N_{\mathrm{cs}}^{(1)}}{8} \right\rceil & \text{otherwise} \end{cases}$$

$$c = \begin{cases} 3 & \text{normal cyclic prefix} \\ 2 & \text{extended cyclic prefix} \end{cases}$$

and for formats 2, 2a and 2b

$$m = \left\lfloor n_{\mathrm{PUCCH}}^{(2)} / \mathrm{N}_{\mathrm{sc}}^{\mathrm{RB}} \right\rfloor$$

Mapping of modulation symbols for the physical uplink control channel is illustrated in Figure 5.4.3-1.

In case of simultaneous transmission of sounding reference signal and PUCCH format 1, 1a or 1b, one SC-FDMA symbol on PUCCH shall punctured.

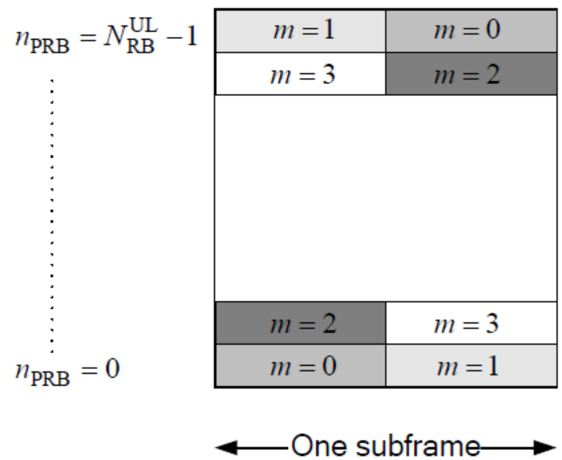


Figure 5.4.3-1: Mapping to physical resource blocks for PUCCH.

See e.g., 3GPP TS 36.211 V8.9.0 at pg. 20-21.

U.S. Patent No. 10,771,302: Claim 23(e)
" the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system."

	The SRS signal may be mapped to a variety of locations in the frequency domain depending on the configuration of the system. Tables 5.5.3.2-1 through 5.5.3.2-4 provide the available LTE configurations. These configurations map the SRS in blocks towards the middle of uplink bandwidth and avoid the resource blocks at the ends of the uplink bandwidth that carry the PUCCH. **5.5.3.2 Mapping to physical resources** The sequence shall be multiplied with the amplitude scaling factor β_{SRS} in order to conform to the transmit power P_{SRS} specified in Section 5.1.3.1 in [4], and mapped in sequence starting with $r^{\mathrm{SRS}}(0)$ to resource elements (k,l) according to $$a_{2k+k_0,l} = \begin{cases} \beta_{\mathrm{SRS}} r^{\mathrm{SRS}}(k) & k = 0,1,\ldots,M_{\mathrm{sc},b}^{\mathrm{RS}}-1 \\ 0 & \text{otherwise} \end{cases}$$

U.S. Patent No. 10,771,302: Claim 23(e)
" the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system."

	where k_0 is the frequency-domain starting position of the sounding reference signal and for $b = B_{SRS}$ $M^{\mathrm{RS}}_{\mathrm{sc},b}$ is the length of the sounding reference signal sequence defined as $$M^{\mathrm{RS}}_{\mathrm{sc},b} = m_{\mathrm{SRS},b} N^{\mathrm{RB}}_{\mathrm{sc}} / 2$$ where $m_{\mathrm{SRS},b}$ is given by Table 5.5.3.2-1 through Table 5.5.3.2-4 for each uplink bandwidth $N^{\mathrm{UL}}_{\mathrm{RB}}$. The cell-specific parameter *srs-BandwidthConfig* $C_{\mathrm{SRS}} \in \{0,1,2,3,4,5,6,7\}$ and the UE-specific parameter *srs-Bandwidth* $B_{\mathrm{SRS}} \in \{0,1,2,3\}$ are given by higher layers. For UpPTS, $m_{\mathrm{SRS},0}$ shall be reconfigured to $m^{\max}_{SRS,0} = \max_{c \in C} \{m^{c}_{SRS,0}\} \le \left(N^{\mathrm{UL}}_{\mathrm{RB}} - 6N_{\mathrm{RA}}\right)$ if this reconfiguration is enabled by the cell specific parameter *srsMaxUpPts* given by higher layers, otherwise if the reconfiguration is disabled $m^{\max}_{SRS,0} = m_{SRS,0}$,where c is a SRS BW configuration and C_{SRS} is the set of SRS BW configurations from the Tables 5.5.3.2-1 to 5.5.3.2-4 for each uplink bandwidth $N^{\mathrm{UL}}_{\mathrm{RB}}$, N_{RA} is the number of format 4 PRACH in the addressed UpPTS and derived from Table 5.7.1-4. The frequency-domain starting position k_0 is defined by $$k_0 = k'_0 + \sum_{b=0}^{B_{\mathrm{SRS}}} 2M^{\mathrm{RS}}_{\mathrm{sc},b} n_b$$ where for normal uplink subframes $k'_0 = \left(\lfloor N^{\mathrm{UL}}_{\mathrm{RB}}/2 \rfloor - m_{\mathrm{SRS},0}/2\right) N^{\mathrm{RB}}_{\mathrm{SC}} + k_{\mathrm{TC}}$, for UpPTS k'_0 is defined by: $$k'_0 = \begin{cases} (N^{UL}_{RB} - m^{\max}_{SRS,0}) N^{RB}_{\mathrm{sc}} + k_{TC} & \text{if } \left((n_f \bmod 2) \times (2 - N_{SP}) + n_{hf}\right) \bmod 2 = 0 \\ k_{TC} & \text{otherwise} \end{cases}$$ $k_{\mathrm{TC}} \in \{0,1\}$ is the parameter *transmissionComb* provided by higher layers for the UE, and n_b is frequency position index. n_{hf} is equal to 0 for UpPTS in first half frame, and equal to 1 for UpPTS in second half frame.

U.S. Patent No. 10,771,302: Claim 23(e)

" the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system."

Table 5.5.3.2-1: $m_{\mathrm{SRS},b}$ and N_b, $b=0,1,2,3$, values for the uplink bandwidth of $6 \le N_{\mathrm{RB}}^{\mathrm{UL}} \le 40$.

SRS bandwidth configuration C_{SRS}	SRS-Bandwidth $B_{\mathrm{SRS}}=0$		SRS-Bandwidth $B_{\mathrm{SRS}}=1$		SRS-Bandwidth $B_{\mathrm{SRS}}=2$		SRS-Bandwidth $B_{\mathrm{SRS}}=3$	
	$m_{\mathrm{SRS},0}$	N_0	$m_{\mathrm{SRS},1}$	N_1	$m_{\mathrm{SRS},2}$	N_2	$m_{\mathrm{SRS},3}$	N_3
0	36	1	12	3	4	3	4	1
1	32	1	16	2	8	2	4	2
2	24	1	4	6	4	1	4	1
3	20	1	4	5	4	1	4	1
4	16	1	4	4	4	1	4	1
5	12	1	4	3	4	1	4	1
6	8	1	4	2	4	1	4	1
7	4	1	4	1	4	1	4	1

Table 5.5.3.2-2: $m_{\mathrm{SRS},b}$ and N_b, $b=0,1,2,3$, values for the uplink bandwidth of $40 < N_{\mathrm{RB}}^{\mathrm{UL}} \le 60$.

SRS bandwidth configuration C_{SRS}	SRS-Bandwidth $B_{\mathrm{SRS}}=0$		SRS-Bandwidth $B_{\mathrm{SRS}}=1$		SRS-Bandwidth $B_{\mathrm{SRS}}=2$		SRS-Bandwidth $B_{\mathrm{SRS}}=3$	
	$m_{\mathrm{SRS},0}$	N_0	$m_{\mathrm{SRS},1}$	N_1	$m_{\mathrm{SRS},2}$	N_2	$m_{\mathrm{SRS},3}$	N_3
0	48	1	24	2	12	2	4	3
1	48	1	16	3	8	2	4	2
2	40	1	20	2	4	5	4	1
3	36	1	12	3	4	3	4	1
4	32	1	16	2	8	2	4	2
5	24	1	4	6	4	1	4	1
6	20	1	4	5	4	1	4	1
7	16	1	4	4	4	1	4	1

Table 5.5.3.2-3: $m_{\mathrm{SRS},b}$ and N_b, $b=0,1,2,3$, values for the uplink bandwidth of $60 < N_{\mathrm{RB}}^{\mathrm{UL}} \le 80$.

SRS bandwidth configuration C_{SRS}	SRS-Bandwidth $B_{\mathrm{SRS}}=0$		SRS-Bandwidth $B_{\mathrm{SRS}}=1$		SRS-Bandwidth $B_{\mathrm{SRS}}=2$		SRS-Bandwidth $B_{\mathrm{SRS}}=3$	
	$m_{\mathrm{SRS},0}$	N_0	$m_{\mathrm{SRS},1}$	N_1	$m_{\mathrm{SRS},2}$	N_2	$m_{\mathrm{SRS},3}$	N_3
0	72	1	24	3	12	2	4	3
1	64	1	32	2	16	2	4	4
2	60	1	20	3	4	5	4	1
3	48	1	24	2	12	2	4	3
4	48	1	16	3	8	2	4	2
5	40	1	20	2	4	5	4	1
6	36	1	12	3	4	3	4	1
7	32	1	16	2	8	2	4	2

U.S. Patent No. 10,771,302: Claim 23(e)
" the probing signal is configured to occupy a portion of spectrum in the uplink frequency band not designated for transmission of uplink control signals in the system."

Table 5.5.3.2-4: $m_{\mathrm{SRS},b}$ and N_b, $b=0,1,2,3$, values for the uplink bandwidth of $80 < N_{\mathrm{RB}}^{\mathrm{UL}} \le 110$.

SRS bandwidth configuration C_{SRS}	SRS-Bandwidth $B_{\mathrm{SRS}}=0$		SRS-Bandwidth $B_{\mathrm{SRS}}=1$		SRS-Bandwidth $B_{\mathrm{SRS}}=2$		SRS-Bandwidth $B_{\mathrm{SRS}}=3$	
	$m_{\mathrm{SRS},0}$	N_0	$m_{\mathrm{SRS},1}$	N_1	$m_{\mathrm{SRS},2}$	N_2	$m_{\mathrm{SRS},3}$	N_3
0	96	1	48	2	24	2	4	6
1	96	1	32	3	16	2	4	4
2	80	1	40	2	20	2	4	5
3	72	1	24	3	12	2	4	3
4	64	1	32	2	16	2	4	4
5	60	1	20	3	4	5	4	1
6	48	1	24	2	12	2	4	3
7	48	1	16	3	8	2	4	2

See e.g., 3GPP TS 36.211 V8.9.0 at pg. 28-31.